ABSTRACT OF THE DISCLOSURE

The adhesion of a capping layer, e.g., silicon nitride, to inlaid Cu is improved with an attendant reduction in hillock formation and, hence, improvement in electromigration resistance, by laser thermal annealing the exposed surface of the inlaid Cu after CMP to remove copper oxide
5 therefrom. Embodiments include laser thermal annealing in NH_3 or H_2 at a temperature of about 370° to about 420° for a short period of time, e.g., about 10 to about 100 nanoseconds, to remove the copper oxide. Embodiments also include sequentially and contiguously laser thermal annealing the exposed planarized surface of inlaid Cu, ramping up the introduction of SiH_4 and then initiating (PECVD) of a silicon nitride capping layer. Embodiments also include Cu dual damascene structures formed in
10 dielectric material having a dielectric constant (k) less than about 3.9.

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